Trend Study 14-26-99

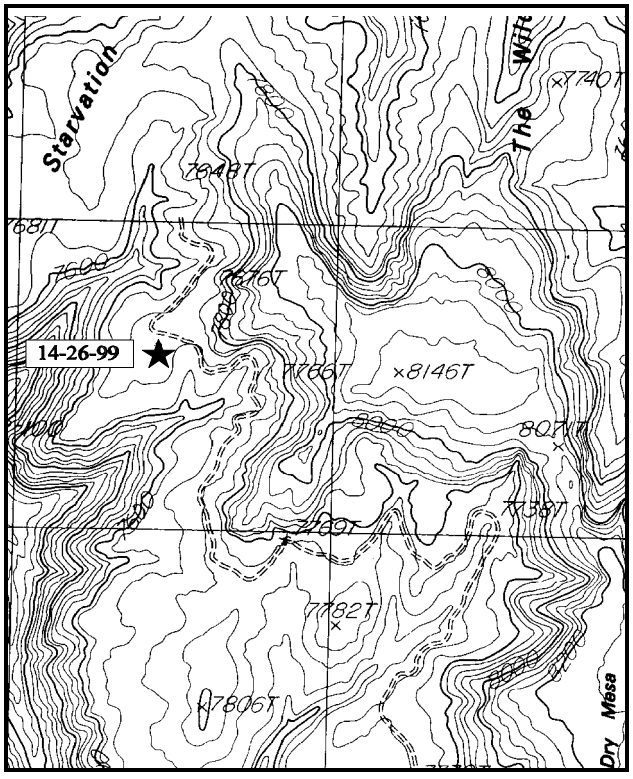
Study site name: The Wilderness . Range type: Mixed Mountain Brush .

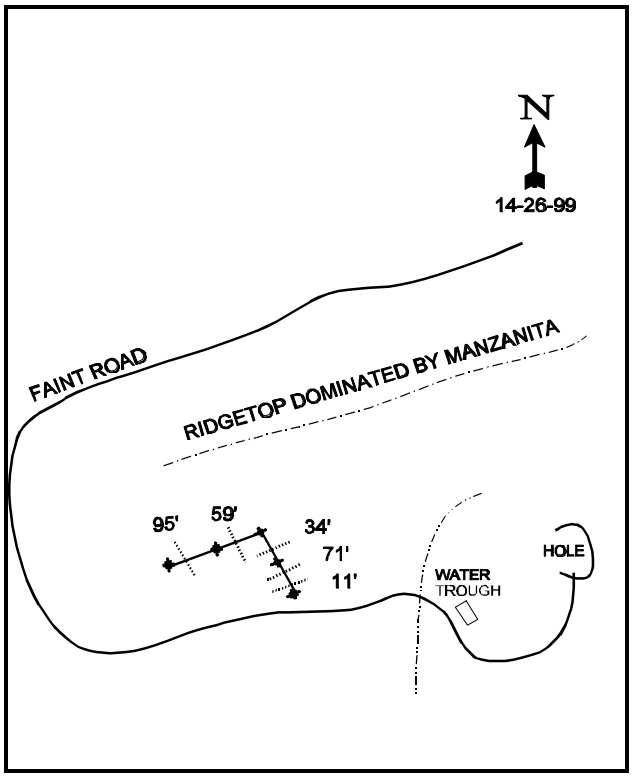
Compass bearing: frequency baseline 341°M.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

LOCATION DESCRIPTION

Just east of the Chippean Rocks on the Elk Ridge-Blanding Road there is a FS "Release Cutting" information sign. From this sign, travel 2.0 miles east to a little meadow on the left (approximately 4.0 miles west of 'The Causeway'). Turn left onto a very faint road that goes across the meadow to the northeast corner and continues through the PIPO forest in a northerly direction for about 4.0 miles. The road becomes washed out and impassable. Continue up the road on foot to a watering trough. From here, go 110 paces, across a stream and up the road to the transect. The transect starting point, a full-high steel fence post, is 5 paces east of the road in a snowberry-grass dominated opening. The 0, 100, and 200-foot stakes are full-high posts; the rest of the baseline is marked by half-high posts. The last 200' of the baseline dogleg at a bearing of 272°M.





Map Name: Chippean Rocks Diagrammatic Sketch

Township 34S , Range 21E , Section 5 UTM 4191361.274 N, 619411.458 E

DISCUSSION

Trend Study No. 14-26 (36-14)

"The Wilderness" trend study is north of the Chippean Rocks-Causeway area and lies within the rolling country between high sandstone mesas and Vega Creek canyon. The area contains rugged country with limited road access. The road to the transect winds through Ponderosa montane forest, clumps of aspen, past steep canyons, springs, and mountain brush covered slopes. This old logging road is overgrown and washed out (impassable with vehicle) about 0.2 mile from the transect starting point. Elevation along the transect varies from 7,600 to 7,700 feet. Aspect also varies, but drainage is generally to the west into Vega Creek, which flows north into North Cottonwood Creek.

The transect was originally placed on the south and north side of a ridge with the frequency baseline on the south side and the 3 circular density plots 500 feet away on the north side. In 1992, the larger sample placed 3 of the of the frequency belts on the south side of the ridge and 2 belts on the north side 500 feet away where the old density plots were found. During the 1999 reading, the study site base line was realigned and placed entirely on the south side of the ridge in order to sample one homogeneous area. Some of the data changes, especially in shrub density are the result of this realignment. The study samples snowberry-grass openings surrounded by pine, oak clumps, and manzanita. The area is very diverse with microsites dominated by various plant communities. Elevation is 7,450 feet with a slope of 12% and a south aspect.

Cattle grazing is the dominant use of the area and is managed on a 3 pasture rest-rotation system as part of the Cottonwood grazing allotment. It is a large allotment with over 20,000 suitable acres. The current stocking rate is 676 head (3,718 AUMs) and an increase is being considered. The season of use is June 16 to Sept 15. The area is considered an important big game summer range, with both deer and elk being seen in the vicinity. Deer sign was frequently found in 1986, and overall use appeared moderate. Resting and escape cover is excellent. Pellet group data from 1999 estimate 5 deer days use/acre (12 ddu/ha), 5 elk days use/acre (12 edu/ha), and 12 cow days use/acre (30 cdu/ha). All of the cattle pats appeared to be from last season. About 20% of the deer and elk pellet groups were recent but the rest appear to be also from last year. Four dead elk (1 bull and 3 cows) were seen just off the road about 1 mile from the site. It appears that they were standing under a tree that was struck by lightning about 1 week before, sometime in mid June.

Soil at the site is very deep with an effective rooting depth estimated at over 30 inches. This is an underestimate since many measurements were limited only by the length of the soil penetrometer. Soil texture is a sandy loam with a neutral pH (6.6). Phosphorus is low at only 5.4 ppm and potassium is marginal at 70.4 ppm. Values less than 10 ppm for phosphorus and 70 ppm for potassium have been shown to limit normal plant growth and development. There is little rock on the surface or within the soil profile with the exception of some exposed sandstone bedrock on top of the ridge. There are some small gullies on the site which originate near the top of the ridge. Protective ground cover is abundant, especially litter cover, leaving little unprotected bare ground.

Although tall Ponderosa pines visually dominate the site, Gambel oak, snowberry, and manzanita are common in the understory. Point quarter data from 1999 estimate 98 Ponderosa trees/acre with an average diameter of nearly 7 inches. Overhead canopy cover is quite variable, but averages 21% for the site. Gambel oak and snowberry are the key understory browse species. Oak displayed moderate to heavy use in 1986, with moderate use noted in1992. Current ('99) use is classified as light. Snowberry was light to moderately browsed in 1986 and 1992, but lightly used in 1999. Density for both species has declined, however the difference is due to the realigning of the baseline in 1999. Other valuable browse plants are less numerous, but together provide an abundance and great variety of browse forage. These species include Woods rose, chokecherry, bitterbrush (heavily hedged), Utah and Rocky Mountain juniper, ceanothus, serviceberry, aspen, and mountain mahogany. Greenleaf manzanita, an undesirable increaser, had a density of 760 plants/acre in 1992 and appeared to be expanding. This undesirable evergreen shrub tends to limit herbaceous cover.

Density was estimated with the realigned baseline at 1,360 plants/acre in 1999. Most of the plants sampled are mature (78%), in good vigor, and unutilized.

Grasses are quite common with 14 species occurring on the transect. The most abundant was needle-and-thread, Kentucky bluegrass, mutton grass, and intermediate wheatgrass. There has been some light utilization of the grasses, but grazing appears to have been heavy in the past. Signs include the presence of increaser and invader species and eroded cattle trails. Forbs also contribute significantly to forage production of the site. Some of the more available and palatable species such as dusty penstemon, redroot buckwheat, lobeleaf groundsel, and lupine show evidence of use. Horsetail, a perennial increaser, is common in the meadow. The occasional elkweed have been heavily utilized.

1986 TREND ASSESSMENT

Based on the old line intercept data comparisons and observations on the study site, the apparent trend is towards thicker vegetative cover, and increased shrub density. The most obvious increase is occurring with manzanita, but that plant is mainly restricted to the rocky shallow soils, leaving the more productive sites to more desirable species. Other shrub populations are vigorous and stable. A continued increase in ponderosa pine could restrict production of the understory. The herbaceous component is productive and healthy, although heavy grazing could lead to a greater dominance of undesirable increasers and invaders. Grazing and logging have contributed to accelerated erosion and gullying, but with the increasing vegetative cover, the soil has stabilized. Localized soil loss occurs on some bare spots and steeper rocky slopes.

1992 TREND ASSESSMENT

The area is a diverse intermix of trees, shrubs, and herbaceous species with small scattered bare areas, eroding livestock trails, and small gullies. The soil trend for this site is stable, but it still has some small scattered bare areas throughout the site which could be improved with the establishment of herbaceous species. The browse trend is slightly upward. With the increase in the sample size, some species have shown either smaller or larger estimates because of their aggregated distribution. It is best to inspect percent decadence, form class, vigor, and biotic potential to help determine the health of each species. With the increase in browse (and related cover), as expected, the herbaceous understory trend is down, with losses for grasses and forbs. However, species diversity for both grasses (14) and forbs (33) are still very high.

TREND ASSESSMENT
soil - stable
browse - slightly up
herbaceous understory - down

1999 TREND ASSESSMENT

Trend for soil appears to be down slightly due to a decline in litter cover and an increase in percent bare soil. Trend for browse appears to be down slightly. Utilization on most shrubs is lighter than during previous readings, but density of the key species, Gambel oak and snowberry, declined considerably. Some of the change is due to the realignment of the baseline in 1999, but that only changed 2 of the 5 frequency/density belts. Ponderosa pine density appears to be increasing with a current overhead canopy cover averaging 21%. Manzanita also appears to be increasing in density and size. Trend for the herbaceous understory is down with a decline in the sum of nested frequency for both grasses and forbs. Cover is also much lower than 1992 estimates.

TREND ASSESSMENT
soil - down slightly
browse - down slightly
herbaceous understory - down

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 26

Type	Species	Nested Frequency '86	'92	'99	Quadrat Frequency '86	'92	'99	Average Cover % '92	'99
G	Agropyron intermedium	26	30	42	8	9	13	2.62	1.37
G	Agropyron trachycaulum	b45	a3	-	20	1	-	.03	-
G	Bouteloua gracilis	12	1	5	6	1	2	.00	.18
G	Bromus anomalus	11	4	4	6	2	2	.06	.06
G	Bromus inermis	1	2	7	1	1	2	.03	.30
G	Bromus tectorum (a)	-	2	13	-	1	5	.00	.05
G	Carex spp.	6	3	9	2	1	3	.15	.04
G	Koeleria cristata	b24	b17	a1	11	7	1	.37	.03
G	Poa fendleriana	21	31	12	9	12	6	1.05	.25
G	Poa pratensis	119	94	104	41	31	34	6.47	2.50
G	Sitanion hystrix	14	16	5	9	8	2	.23	.01
G	Sporobolus cryptandrus	b25	a2	a1	12	1	1	.04	.00
G	Stipa columbiana	a-	b14	ab2	-	5	1	.24	.03
G	Stipa comata	b148	b128	a56	59	48	23	6.64	1.63
Total for Annual Grasses		0	2	13	0	1	5	0.00	0.05
Total for Perennial Grasses		452	345	248	184	127	90	17.97	6.42
Total for Grasses		452	347	261	184	128	95	17.97	6.47
F	Achillea millefolium	a-	b34	a-	-	13	-	.70	-
F	Agoseris glauca	-	-	3	-	-	1	-	.03
F	Arabis spp.	a-	b5	ab6	-	2	3	.03	.01
F	Artemisia dracunculus	-	-	1	-	-	1	-	.03
F	Artemisia ludoviciana	17	3	15	7	1	5	.15	.36
F	Aster spp.	a-	a-	b7	-	-	3	-	.06
F	Castilleja linariaefolia	b6	a-	a-	3	-	-	-	-
F	Chenopodium album (a)	-	6	2	-	2	2	.01	.01
F	Comandra pallida	36	17	11	14	9	6	.17	.08
F	Collinsia parviflora (a)	-	a-	b18	-	-	8	-	.04
F	Cryptantha flavoculata	b14	b7	a-	6	4	-	.09	-
F	Cymopterus spp.	a-	b5	a-	-	3	-	.21	-
F	Descurainia pinnata (a)	-	-	2	-	-	1	-	.03
F	Epilobium brachycarpum (a)	-	-	1	-	-	1	-	.00
F	Equisetum arvense	b162	a47	a25	57	18	11	.86	.05
F	Eriogonum alatum	a-	a-	b7	-	-	3	-	.09
F	Erigeron spp.	b36	a14	a22	20	6	10	.14	.58
F	Eriogonum racemosum	a2	a6	b28	1	3	12	.18	.62
F	Eriogonum umbellatum	5	7	13	2	3	4	.18	.33
F	Frasera speciosa	-	1	-	-	1	-	.18	-
F	Geranium fremontii	8	8	7	6	5	3	.37	.33

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'92	'99	'86	'92	'99	'92	'99
F	Geum spp.	$_{a}$-	$_{b}$7	$_{a}$-	-	3	-	.45	-
F	Hackelia patens	$_{a}$-	$_{b}$7	$_{a}$-	-	4	-	.12	-
F	Heterotheca villosa	11	6	4	5	4	2	.21	.15
F	Hymenoxys richardsonii	-	1	3	-	1	1	.03	.00
F	Lappula occidentalis (a)	-	$_{a}$-	$_{b}$10	-	-	4	-	.07
F	Lesquerella rectipes	$_{a}$-	$_{b}$6	$_{b}$5	-	3	3	.01	.06
F	Lithospermum ruderale	$_{a}$-	$_{a}$-	$_{b}$23	-	-	9	.00	.14
F	Lomatium spp.	-	1	-	-	1	-	.00	-
F	Lupinus sericeus	69	68	53	30	30	23	2.32	3.42
F	Machaeranthera canescens	$_{b}$27	$_{a}$9	$_{a}$8	14	5	3	.02	.04
F	Oenothera pallida	$_{b}$69	$_{a}$24	$_{a}$31	33	9	15	.12	.27
F	Penstemon comarrhenus	$_{c}$114	$_{b}$60	$_{a}$18	47	29	10	1.22	.15
F	Phacelia hastata	$_{b}$27	$_{b}$14	$_{a}$-	13	7	-	.19	-
F	Phlox longifolia	$_{a}$-	$_{c}$58	$_{b}$16	-	24	7	1.22	.08
F	Physalis longifolia	-	2	-	-	2	-	.01	-
F	Polygonum douglasii (a)	-	$_{b}$33	$_{a}$4	-	14	3	.41	.01
F	Senecio multilobatus	$_{b}$155	$_{a}$26	$_{a}$11	66	10	6	.27	.14
F	Stellaria jamesiana	$_{a}$-	$_{b}$7	$_{a}$-	-	4	-	.12	-
F	Taraxacum officinale	1	3	-	1	1	-	.00	-
F	Thalictrum fendleri	$_{a}$-	$_{b}$15	$_{a}$-	-	6	-	.30	-
F	Tragopogon dubius	$_{b}$51	$_{a}$8	$_{a}$2	20	3	1	.04	.03
F	Unknown forb-annual (a)	-	$_{b}$6	$_{a}$-	-	4	-	.02	-
F	Unknown forb-perennial	$_{b}$74	$_{a}$-	$_{ab}$3	31	-	1	-	.00
F	Vicia americana minor	$_{a}$-	$_{b}$24	$_{a}$-	-	10	-	.33	-
F	Viguiera multiflora	3	-	-	1	-	-	-	-
Total for Annual Forbs		0	45	37	0	20	19	0.43	0.17
Total for Perennial Forbs		887	500	322	377	224	143	10.33	7.13
Total for Forbs		887	545	359	377	244	162	10.77	7.30

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 14 , Study no: 26

Type	Species	Strip Frequency '92	Strip Frequency '99	Average Cover % '92	Average Cover % '99
B	Amelanchier utahensis	15	3	1.17	.06
B	Arctostaphylos patula	19	35	14.35	16.36
B	Ceanothus fendleri	13	0	.89	-
B	Cercocarpus spp.	0	2	-	.41
B	Juniperus osteosperma	0	0	-	-
B	Mahonia repens	6	7	.24	.21
B	Pinus ponderosa	6	9	15.32	3.09
B	Populus tremuloides	3	0	1.25	-
B	Prunus virginiana	6	7	.15	.48
B	Purshia tridentata	2	1	.38	-
B	Quercus gambelii	21	5	7.59	.44
B	Rosa woodsii	30	16	1.54	.69
B	Symphoricarpos oreophilus	71	48	15.28	9.29
Total for Browse		192	133	58.20	31.04

CANOPY COVER --
Herd unit 14 , Study no: 26

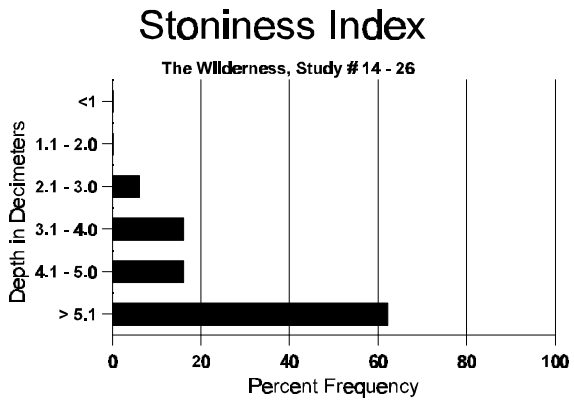
Species	Percent Cover '99
Amelanchier utahensis	.40
Pinus ponderosa	21
Prunus virginiana	2
Quercus gambelii	6

BASIC COVER --
Herd unit 14 , Study no: 26

Cover Type	Nested Frequency '92	Nested Frequency '99	Average Cover % '86	Average Cover % '92	Average Cover % '99
Vegetation	298	275	7.00	64.96	41.85
Rock	4	6	0	1.53	.03
Pavement	4	-	0	0	0
Litter	249	371	71.75	75.31	63.02
Cryptogams	3	24	.25	.54	.31
Bare Ground	86	182	21.00	8.48	23.02

SOIL ANALYSIS DATA --
Herd Unit 14, Study # 26, Study Name: The Wilderness

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
30.3	61.8 (17.7)	6.6	74.0	15.4	10.6	1.7	5.4	70.4	0.4



PELLET GROUP DATA --
Herd unit 14 , Study no: 26

Type	Quadrat Frequency '92	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	3	8	N/A
Elk	6	4	5 (12)
Deer	7	2	5 (12)
Cattle	3	3	12 (30)

BROWSE CHARACTERISTICS --
Herd unit 14 , Study no: 26

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	2	-	-	3	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	3	17	3	1	-	-	6	-	-	19	7	4	-	600			30
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	1	-	-	-	-	1	-	-	2	-	-	-	40	-	-	2
	99	2	-	1	-	-	-	-	-	-	3	-	-	-	60	42	40	3
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	1	-	-	-	-	-	-	-	-	-	1	20			1
	99	1	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'92	55%	12%	15%	-88%
'99	00%	25%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'86	0		0%
	'92	660		3%
	'99	80		25%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Arctostaphylos patula																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	2	-	-	3	-	-	2	-	-	7	-	-	-	140			7
	99	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	86	6	-	-	-	-	-	-	-	-	5	1	-	-	400	33	69	6
	92	26	-	-	-	-	-	-	-	-	25	-	1	-	520	-	-	26
	99	53	-	-	-	-	-	-	-	-	53	-	-	-	1060	39	75	53
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	3	-	-	-	2	-	-	-	-	1	-	4	-	100			5
	99	8	-	-	-	-	-	-	-	-	6	-	-	2	160			8
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	+47%
'92	05%	00%	13%	+44%
'99	00%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	400	Dec:		0%
'92	760			13%
'99	1360			12%

Ceanothus fendleri

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	41	-	-	-	-	-	33	-	-	74	-	-	-	1480			74
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	2	-	-	-	-	-	-	2	-	-	-	133	11	6	2
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	100%	00%	+91%
'92	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	133	Dec:		-
'92	1480			-
'99	0			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus spp.																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	1	-	-	-	-	-	-	-	1	-	-	-	20	6	44	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'92	00%	00%	00%	
'99	25%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'92	0		-
	'99	80		-

Juniperus osteosperma

S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'92	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'92	0		-
	'99	0		-

Mahonia repens

Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	24	-	-	-	-	-	9	-	-	33	-	-	-	660			33
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	12	-	-	-	-	-	4	-	-	16	-	-	-	320	-	-	16
	99	27	-	-	-	-	-	-	-	-	27	-	-	-	540	3	6	27

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'92	00%	00%	00%	-41%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'92	980		-
	'99	580		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus ponderosa																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	92	1	-	-	-	-	-	1	-	-	2	-	-	-	40			2
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	1	-	1	-	-	-	2	-	4	-	-	-	80	-	-	4
	99	3	-	-	-	-	-	-	2	1	6	-	-	-	120	-	-	6
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	-10%
'92	17%	00%	00%	+33%
'99	00%	11%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	133	Dec:	-
	'92	120		-
	'99	180		-

Populus tremuloides																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	1	-	-	2	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	1	-	1	-	-	-	20	-	-	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'92	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'92	60		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Prunus virginiana																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	3	-	-	-	-	-	3	-	-	-	60			3
	99	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
Y	86	2	1	1	1	-	-	-	-	-	5	-	-	-	333			5
	92	7	3	-	1	-	-	1	-	-	12	-	-	-	240			12
	99	22	-	-	-	-	-	-	-	-	22	-	-	-	440			22
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	2	-	2	-	-	-	40	60	40	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	20%	20%	00%	-28%
'92	25%	00%	00%	+50%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	333	Dec:	-
	'92	240		-
	'99	480		-

Purshia tridentata																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	3	-	-	3	-	-	-	60			3
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	-	-	-	-	-	-	1	-	-	1	-	-	-	20	-	-	1
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	21	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'92	00%	00%	00%	-75%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'92	80		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
S	86	24	1	-	26	-	-	-	-	-	49	2	-	-	3400			51
	92	45	1	-	35	-	-	8	-	-	57	32	-	-	1780			89
	99	21	-	-	-	-	-	-	-	-	21	-	-	-	420			21
Y	86	10	3	14	6	1	-	-	-	-	32	-	2	-	2266			34
	92	28	15	-	12	2	-	4	-	-	37	24	-	-	1220			61
	99	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
M	86	-	-	1	1	-	-	-	-	-	2	-	-	-	133	59	13	2
	92	8	15	-	-	4	-	-	-	-	13	11	3	-	540	-	-	27
	99	-	-	-	-	-	-	-	5	-	5	-	-	-	100	59	39	5
D	86	-	-	6	-	-	-	-	-	-	4	1	1	-	400			6
	92	2	3	-	1	-	-	-	-	-	5	-	-	1	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	10%	50%	07%	-33%
'92	41%	00%	04%	-84%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	2799	Dec:	14%
	'92	1880		6%
	'99	300		0%

Rosa woodsii																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	86	4	1	-	-	-	-	-	-	-	5	-	-	-	333			5
	92	61	20	-	6	-	-	9	-	-	93	3	-	-	1920			96
	99	14	-	-	1	-	-	-	-	-	15	-	-	-	300			15
M	86	1	2	3	-	-	-	-	-	-	6	-	-	-	400	19	6	6
	92	-	12	3	3	-	-	-	-	-	18	-	-	-	360	-	-	18
	99	11	-	-	-	-	-	-	-	-	11	-	-	-	220	30	21	11
D	86	1	-	-	-	-	-	-	-	-	-	-	-	1	66			1
	92	1	3	1	-	-	-	-	-	-	1	-	4	-	100			5
	99	4	-	-	-	-	-	-	-	-	3	-	-	1	80			4
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	25%	25%	08%	+66%
'92	29%	03%	03%	-75%
'99	00%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	799	Dec:	8%
	'92	2380		4%
	'99	600		13%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	86	2	-	-	-	4	-	-	-	-	6	-	-	-	400			6
	92	10	-	-	7	-	-	2	-	-	19	-	-	-	380			19
	99	26	-	-	-	-	-	-	-	-	26	-	-	-	520			26
Y	86	18	4	-	2	2	-	-	-	-	23	-	3	-	1733			26
	92	67	36	-	8	-	-	13	-	-	120	-	4	-	2480			124
	99	45	-	-	3	-	-	-	-	-	48	-	-	-	960			48
M	86	26	10	-	-	-	-	-	-	-	35	1	-	-	2400	31	20	36
	92	88	38	5	6	1	-	2	-	-	135	-	5	-	2800	-	-	140
	99	130	-	-	4	-	-	-	-	-	133	-	-	-	2680	28	42	134
D	86	11	4	3	-	-	-	-	-	-	16	-	2	-	1200			18
	92	8	1	-	1	4	-	-	-	-	6	-	6	2	280			14
	99	4	-	-	-	-	-	-	-	-	2	-	-	2	80			4
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	25%	04%	06%	+ 4%
'92	29%	02%	06%	-33%
'99	00%	00%	01%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	5333	Dec:	23%
	'92	5560		5%
	'99	3720		2%